

Perceived Outcomes of Bee Venom Therapy Among Individuals with Inflammatory Conditions: A Cross-Sectional Survey

Zinab Masoud¹, Mahboba Aldareh^{1*}

¹ Department of Foundation year, Faculty of Health Science, University of Tobruk, Tobruk, Libya.

*Corresponding author email: Mahboba Aldareh | mahboba.albareh@tu.edu.ly

Received: 12-05-2026 | Accepted: 15-08-2026 | Available online: 31-08-2026 | DOI:10.5281/zenodo.22206139

ABSTRACT

The honeybee (*Apis mellifera*) produces venom containing bioactive compounds that are often used in complementary medicine. However, clinical evidence remains limited, and patient experiences are largely anecdotal. This cross-sectional questionnaire-based study aimed to evaluate the self-reported perceived outcomes and usage patterns of bee venom therapy among individuals with various inflammatory conditions. An online survey was administered to 170 participants. Data collected included demographics, specific inflammatory conditions (e.g., Rheumatoid Arthritis, Psoriasis), treatment modalities (direct sting vs. injection), and self-reported improvement scales. Statistical analysis, including Chi-square tests, was used to explore associations between administration methods and perceived symptom relief. Most participants were female (91%) and adults aged ≥ 18 years (95%). Bee venom was administered via direct stings (21%) and injected venom (6%). Notably, a significant proportion (73%) used unspecified or inconsistent methods. While some participants reported subjective improvements across all groups (~60-69%), cross-tabulation analysis revealed no statistically significant association between the method of administration and the rate of perceived improvement ($p = 0.613$). Bee venom therapy is utilized by patients for various inflammatory conditions, with many reporting perceived symptom relief. However, the lack of statistical difference in outcomes based on administration methods, combined with the reliance on self-reported data and unspecified dosing, strongly suggests that these perceived benefits may be influenced by subjective or placebo effects. These findings highlight the absolute necessity for rigorous, double-blind randomized controlled trials to establish any true pharmacological efficacy.

Keywords: Honeybee venom, *Apis mellifera*, inflammatory diseases, bee venom therapy, melittin, phospholipase A2.

النتائج المتوقعة للعلاج بسم النحل لدى الأفراد المصابين بأمراض التهابية: دراسة استقصائية مقطعية

زينب مسعود¹، محبوبية الدارة^{1*}

¹ قسم الاتجاه العام، كلية العلوم الصحية، جامعة طبرق، طبرق، ليبيا.

*المؤلف المراسل: محبوبية الدارة | mahboba.albareh@tu.edu.ly

استقبلت: 2026-05-12 | قبلت: 2026-08-15 | متوفرة على الانترنت | 2026-08-31 | DOI:10.5281/zenodo.22206139

ملخص البحث

ينتج نحل العسل *Apis mellifera* سمًا يحتوي على مركبات نشطة حيويًا قد تكون ذات أهمية محتملة في علاج الأمراض الالتهابية والمناعية. هدفت هذه الدراسة المقطعية القائمة على الاستبيان إلى تقييم تجارب 170 مشاركًا استخدموا العلاج بسم النحل تضمنت البيانات المجموعة الخصائص الديموغرافية، الحالات الالتهابية المحددة (مثل التهاب

المفاصل الروماتويدي، الصدفية)، طرق الإعطاء (اللسع المباشر مقابل الحقن)، ومقاييس التحسن المُبلغ عنها ذاتيًا. تم استخدام التحليل الإحصائي، بما في ذلك اختبارات مربع كاي (Chi-square)، لاستكشاف الروابط بين طرق الإعطاء وتخفيف الأعراض المُدرك. كان معظم المشاركين من الإناث (91%) والبالغين (≤ 18 عامًا) بنسبة (95%). تم إعطاء سم النحل عن طريق اللسعات المباشرة (21%) والحقن (6%). والجدير بالذكر أن نسبة كبيرة (73%) استخدمت طرقًا غير محددة أو غير متسقة. في حين أُبلغ بعض المشاركين عن تحسن شخصي في جميع المجموعات (حوالي 60-69%)، أظهر التحليل الإحصائي أنه لا يوجد ارتباط ذو دلالة إحصائية بين طريقة الإعطاء ومعدل التحسن المُدرك ($p = 0.613$). يُستخدم العلاج بسم النحل من قبل المرضى لمختلف الحالات الالتهابية، مع إبلاغ العديد منهم عن تخفيف مُدرك للأعراض. ومع ذلك، فإن عدم وجود فرق إحصائي في النتائج بناءً على طرق الإعطاء، إلى جانب الاعتماد على البيانات المُبلغ عنها ذاتيًا والجرعات غير المحددة، يشير بقوة إلى أن هذه الفوائد المُدركة قد تتأثر بتأثيرات نفسية (وهمية) أو انطباعات ذاتية. تبرز هذه النتائج الضرورة القصوى لإجراء تجارب سريرية عشوائية مزدوجة التعمية ومحكمة لإثبات أي فعالية دوائية حقيقية.

الكلمات المفتاحية: سم نحل العسل، *Apis mellifera*، الأمراض الالتهابية، العلاج بسم النحل، الميليتين، فوسفوليباز A2.

1. Introduction

The honeybee, *Apis mellifera*, plays a crucial role not only in pollination and ecosystem maintenance but also in complementary and alternative medicine due to its biologically active products [1]. Among these, bee venom has attracted scientific interest because of its complex chemical composition. Bee venom is a mixture of peptides, enzymes, and bioactive amines. Melittin, comprising approximately 40–60% of the venom's dry weight, has been studied *in vitro* for its anti-inflammatory and antimicrobial properties [4; 5]. Phospholipase A2 (=12–15% of dry weight) is known to modulate immune responses [2].

While *in vitro* and animal models suggest potential pathways through which bee venom might modulate inflammation [7; 8], translating these findings into clinical efficacy remains challenging. In real-world settings, patients frequently turn to bee venom therapy (apitherapy) for refractory inflammatory, immunological, and neurological conditions, often outside of conventional medical oversight.

Hypothesis: Despite its popularity in certain alternative medicine circles, there is a significant lack of standardized epidemiological data regarding how patients use this therapy, the specific conditions they attempt to treat, and their subjective perception of its effectiveness. Most existing literature focuses on isolated clinical case reports or basic science, leaving a gap in understanding patient-driven usage patterns.

Therefore, this cross-sectional study aims to document the perceived outcomes and usage patterns of *A. mellifera* venom among individuals self-reporting inflammatory conditions. We hypothesize that administration methods (direct stings vs. injections) may influence the degree of patient-reported symptom relief, though we acknowledge these are purely subjective observations.

2. Materials and Methods

2.1. Study Design and Setting

A descriptive, cross-sectional, questionnaire-based study was conducted between November 2022 and March 2023. The survey was distributed online targeting individuals who had previously undergone or were currently undergoing bee venom therapy.

2.2. Participants and Sampling

A convenience sampling method was utilized. A total of 170 individuals completed the survey. No formal sample size calculation or power analysis was conducted *a priori*, which reflects the exploratory nature of this pilot survey.

- **Inclusion Criteria:** Adults (≥ 18 years) who self-reported a diagnosed inflammatory, immunological, or neurological condition and had a history of using bee venom therapy.
- **Exclusion Criteria:** Individuals under 18 years of age (responses filtered out if included by error), incomplete questionnaires, and those using bee products strictly for nutritional purposes rather than venom therapy.

2.3. Questionnaire Design

A structured online questionnaire was developed based on a review of existing apitherapy literature. The tool collected data on:

1. Demographics (Age, Gender).
2. Specific self-reported clinical conditions (e.g., Rheumatoid arthritis, Psoriasis, Multiple Sclerosis) rather than broad categories.
3. Method of bee venom administration (Direct live bee sting, Injection of purified venom, or Other/Unspecified).
4. Treatment parameters (duration and frequency).
5. Perceived improvement, assessed using a self-reported Likert-type scale (e.g., No improvement, Mild, Moderate, Significant improvement) or numerical pain/symptom scale.

2.4. Ethical Considerations

Participation was entirely voluntary. Electronic informed consent was obtained from all respondents prior to accessing the questionnaire, ensuring data confidentiality and anonymity.

2.5. Statistical Analysis

Data were exported, coded, and analyzed using SPSS Statistics version 26.0. Descriptive statistics were summarized as frequencies(n) and percentages (%) for categorical variables. To test the association between categorical variables the Chi-square test was employed. A *p* - value of <0.05 was considered statistically significant.

3. Results

3.1. Demographic Characteristics

A total of 170 individuals participated in the study. The cohort was predominantly female ($n=155$, 91.2%), while males accounted for 8.8% ($n=15$). The vast majority of respondents were

3.2. Clinical Conditions Treated

Participants self-reported utilizing bee venom for a variety of specific conditions. Based on the responses, conditions were categorized as follows:

- Immunological/Autoimmune disorders (e.g., Rheumatoid Arthritis, Lupus): n=20.
- Musculoskeletal and Joint diseases (e.g., Osteoarthritis): n=10
- Dermatological conditions (e.g., Psoriasis, Eczema): n=8
- Neurological conditions (e.g., Multiple Sclerosis): n=4

3.3. Administration Methods and Perceived Outcomes

Regarding the delivery method of the venom, 21.2% (n=36) used direct live bee stings, and 5.9% (n=10) used injected, purified bee venom. Notably, the overwhelming majority, 72.9% (n=124), reported using "other," inconsistent, or unspecified methods.

To explore potential trends between how the venom was administered and the patients' subjective feeling of improvement, a cross-tabulation analysis was performed (Table 1).

Table 1: Association between Bee Venom Administration Method and Self-Reported Perceived Improvement (N=170)

Administration Method	Total (n)	Reported Improvement (n, %)	No Improvement / Unsure (n, %)	P-value
Direct Bee Sting	36	25 (69.4%)	11 (30.6%)	{0.613}
Purified Injection	10	6 (60.0%)	4 (40.0%)	
Unspecified / Other	124	75 (60.5%)	49 (39.5%)	

*Calculated using Chi-square test. Level of significance set at $p < 0.05$.

The statistical analysis ($p = 0.613$) shown in table (1) indicates that there is no statistically significant association between the method of bee venom administration and the self-reported improvement. The reported rates of improvement were relatively similar across all groups, regardless of whether a direct sting, purified injection, or unspecified method was used).

4. Discussion

The current survey aimed to capture the real-world experiences and perceived outcomes of patients utilizing bee venom therapy for various inflammatory disorders.

4.1. Patient Demographics and Usage Patterns

The striking predominance of female participants (91%) strongly aligns with existing epidemiological data on complementary and alternative medicine (CAM), which consistently shows that women are significantly more likely to seek out and utilize alternative therapies for chronic pain and autoimmune conditions compared to men [1; 2].

A major finding of this study is the high prevalence of unstandardized treatment. While 21% used direct stings and 6% used clinical injections, an alarming 73% of participants could not accurately specify their method of treatment, dosage, or frequency. This highlights a critical issue in apitherapy: the lack of clinical regulation, standardized dosing protocols, and patient education.

4.2. Perceived Effectiveness vs. Clinical Reality

Participants reported varying degrees of self-perceived improvement (~60-69% across groups). Historically, some researchers suggest that natural venom delivery (direct stings) might result in a broader exposure to bioactive components like melittin, potentially explaining why some patients favor it over purified injections [3; 6].

However, our statistical cross-tabulation revealed no significant difference in perceived outcomes between direct stings, injections, or unspecified methods ($p = 0.613$). This non-significant finding is clinically highly relevant. It strongly suggests that the "improvements" noted in this study may be heavily influenced by the placebo effect, which is notoriously high in alternative medicine for chronic pain and autoimmune disorders. Without objective clinical biomarkers (e.g., C-Reactive Protein levels, Erythrocyte Sedimentation Rate, or formal radiological assessments), we cannot attribute these reported improvements to the pharmacological action of the venom itself.

4.3. Study Limitations

This study has several significant methodological limitations that must be acknowledged:

1. **Self-Reported Data:** All outcomes (disease diagnosis and symptom improvement) are based entirely on subjective patient recall, leading to severe recall bias and subjectivity.
2. **Lack of Clinical Validation:** No medical records, lab tests, or inflammatory markers were evaluated to confirm the participants' baseline disease severity or post-treatment outcomes.
3. **Ambiguity of Treatment (The 73% factor):** The fact that 73% of the sample used unspecified methods makes it impossible to draw specific correlations regarding dose-response or therapeutic efficacy.
4. **Sampling and Statistics:** The use of convenience sampling without a rigorous power analysis limits the generalizability of the findings. The study provides descriptive frequencies rather than robust causal evidence.

5. Conclusions

This cross-sectional survey indicates that individuals with various inflammatory and immune-related conditions utilize bee venom therapy, with a subset of patients self-reporting perceived symptomatic relief. However, these findings do not constitute clinical evidence of therapeutic efficacy. The heavy reliance on subjective data, the lack of medical diagnostics, the highly unstandardized methods of administration, and the lack of statistical difference in outcomes between administration methods preclude any definitive conclusions regarding the pharmacological effectiveness or causal benefits of bee venom.

These preliminary observations underscore the urgent need for well-designed, double-blind, placebo-controlled clinical trials. Future research must utilize standardized venom dosing, strictly defined patient cohorts, and objective biological markers to separate true pharmacological effects from placebo responses.

Acknowledgment

we thank all the participants of the survey.

Reference

- [1]. Bogdanov S. Bee venom: composition, health, medicine: a review. *Peptides*. 2015;1:1-20.

- [2]. Koo TH, Zakaria AD, Mustafa MZ. Honey clinical applications in complementary medicine: A critical review. J Pharm Pharmacogn Res. 2024;12(6):1040-55
- [3]. Oršolić N. Bee venom in cancer therapy. Cancer and metastasis reviews. 2012 Jun;31(1):173-94.
- [4]. Ownby CL, Powell JR, Jiang MS, Fletcher JE. Melittin and phospholipase A2 from bee (*Apis mellifera*) venom cause necrosis of murine skeletal muscle in vivo. Toxicon. 1997 Jan 1;35(1):67-80.
- [5]. Lee WR, Pak SC, Park KK. The protective effect of bee venom on fibrosis causing inflammatory diseases. Toxins. 2015 Nov 16;7(11):4758-72.
- [6]. Wehbe R, Frangieh J, Rima M, El Obeid D, Sabatier JM, Fajloun Z. Bee venom: Overview of main compounds and bioactivities for therapeutic interests. Molecules. 2019 Aug 19;24(16):2997.
- [7]. Lee SM, Lim J, Lee JD, Choi DY, Lee S. Bee venom treatment for refractory postherpetic neuralgia: a case report. The Journal of Alternative and Complementary Medicine: Paradigm, Practice, and Policy Advancing Integrative Health. 2014 Mar;20(3):212-4.
- [8]. Kwon YB, Lee JD, Lee HJ, Han HJ, Mar WC, Kang SK, Beitz AJ, Lee JH. Bee venom injection into an acupuncture point reduces arthritis associated edema and nociceptive responses. Pain. 2001 Feb 15;90(3):271-80.